

## Supported Commands

The switcher can be controlled from a remote device or computer via GV Grass Valley® GVG100 commands. These commands can either be sent to the switcher over a serial or Telnet connection.

### Sending GVG100 LUA Commands to the Switcher

The switcher accepts direct injection of GVG100 commands using LUA via a Telnet connection. This allows you to perform various functions such as querying the switcher for the state of buttons, or sending commands to the switcher, such as transitioning a key.

#### To Set the Switcher to Editor Mode

*Tip:* You can quickly turn off editor mode by pressing and holding the **MENU** button and pressing **PERS**.

1. Press **MENU** > **Pers**.
2. Use the **Editor** knob to select **On** to allow the switcher to be controlled by an external editor.

#### GVG100 Command Modes

The switcher supports two modes of operation, a Legacy mode for basic GVG100 commands, and a Ross mode for additional Ross-specific extensions to the protocol.

- **Legacy Mode** — allows basic control over a single ME (ME 1) and the first two keyers (Key 1 and Key 2) on that ME
- **Ross Mode** — allows advanced control over multiple MEs, keyers, and aux buses.

#### To Send GVG Commands to the Switcher

1. Create a connection to the switcher.
  - **Telnet** — Create a Telnet connection to the switcher on port **2100**. The default IP address of the switcher is 192.168.0.123.
  - **Serial** — Open a serial connection to the switcher editor port. Refer to the *GV Grass Valley® GVG100* setup sheet for information on connecting to an editor over a serial connection.
2. At the `gvg100>` prompt, enter the commands you want to run.
  - `injectGVG100command( " " )` — Sends a GVG100 command to the switcher.
  - `print( )` — Prints the value of any arguments as strings, or prints "nil" if an argument is not a string.
  - `printhelp( )` — Prints detailed help on all available commands.
  - `printheX( )` — Prints the value of number arguments as hex strings. If the argument is not a number then "nan" is printed. If the argument is not an unsigned integer (a float or a negative number) then "notUInt" is printed.
  - `setGVG100legacymode( )` — Switches between GVG100 legacy mode (**true**) and Ross mode (**false**) command interpretation.

#### Example Commands

- `setGVGlegacymode( false )` — sets Ross Mode.

# ROSS

- `injectGVG100command("0501CC501405")` — select BKGD and keys 2 and 3 for the Next Trans of ME 2, with a rate of 45.
- `injectGVG100command("0300FB1F")` — perform fade to black.

## Supported GVG100 Commands

The switcher supports a number of GVG100 commands. The exact commands and how the switcher reacts to the commands is outlined in the following tables.

**Keep the following in mind when controlling the switcher via GVG100 commands:**

- When performing a memory store or recall, the bus is set using the effects address, where 00 is all buses, and specific buses are set using the effects address as a bitfield. For example an effects address of 02 (0000 0010) is ME 2, and 13 (0001 0011) is MEs 1, 2 and MiniME™ 3.
- When using Legacy mode, the effects address of 1 means keyer 1 and effects address of 0 means keyer 2. Using this interpretation, only keyers 1 and 2 of ME 1 are accessible. Only ME 1 is accessible.
- The table of supported GVG100 commands shows whether the command uses the ME bits, the ME and keyer bits, or neither. This only applies in Ross mode.

**Table 1: Carbonite Effects Addresses**

Bus	Bits for Non-Memory Commands (Hex)	Bits for Memory Commands
ME 1	0000 0000 (0x00)	0000 0001
ME 2	0000 0001 (0x01)	0000 0010
MiniME™ 1	0000 0010 (0x02)	0000 0100
MiniME™ 2	0000 0011 (0x03)	0000 1000
MiniME™ 3	0000 0100 (0x04)	0001 0000
MiniME™ 4	0000 0101 (0x05)	0010 0000
MultiScreen 1	0000 0110 (0x06)	0100 0000
MultiScreen 2	0000 0111 (0x07)	1000 0000
Key 1	0000 0000 (0x00)	--
Key 2	0001 0000 (0x10)	--
Key 3	0010 0000 (0x20)	--
Key 4	0011 0000 (0x30)	--
Aux 1	1000 0000 (0x80)	--
Aux 2	1000 0001 (0x81)	--
Aux 3	1000 0010 (0x82)	--
Aux 4	1000 0011 (0x83)	--
Aux 5	1000 0100 (0x84)	--
Aux 6	1000 0101 (0x85)	--
Aux 7	1000 0110 (0x86)	--
Aux 8	1000 0111 (0x87)	--

**Table 2: Carbonite Video Source Mapping**

Map-To	Source
0	Black
1-24	Input BNC 1-24
100	Matte
110-113	Media-Store channels 1-4
150	Program
151	Preview
152	Clean Feed
155	ME 1 Program
156	ME 1 Preview
157	ME 1 Clean Feed
160	ME 2 Program
161	ME 2 Preview
162	ME 2 Clean Feed
210	MiniME™ 1
211	MiniME™ 2
212	MiniME™ 3
213	MiniME™ 4

**Table 3: CrossOver® 12 Video Source Mapping**

Map-To	Source
0	Black
1-8	Input BNC 1-8
10	Matte
11-14	Input BNC 9-12
17-18	Media-Store channels 1-2
19	Program (Aux only)
20	Preview (Aux only)
21	Clean Feed (Aux only)
22	Chroma Key Alpha (Aux only)

**Table 4: CrossOver® 6 Video Source Mapping**

Map-To	Source
0	Black

Map-To	Source
1-4	Input BNC 1-4
5	--
6	Matte
7-8	Input BNC 5-6
9-10	Media-Store channels 1-2
11	Program (Aux only)
12	Preview (Aux only)
13	Clean Feed (Aux only)
14	Chroma Key Alpha (Aux only)

**Note:** For the following table, ME can be an ME, a MiniME™, a MultiScreen, or an Aux bus.

**Table 5: Supported GVG100 Commands**

Name	ME / Keyer	Length	Byte Code	Data / Notes	
Read ME Program Bus	ME	2	41	--	
Read ME Preset Bus	ME	2	42	--	
Read Keyer Bus	Keyer	2	43 / 44	--	
Write ME Program Bus	ME	3	C1	<xpt>	An invalid xpt request returns a protocol error.
Write ME Preset Bus	ME	3	C2	<xpt>	An invalid xpt request returns a protocol error.
Write Keyer Bus	Keyer	3	C3 / C4	<xpt>	An invalid xpt request returns a protocol error.
Read Analog	--	3	45	<control>	
Write Analog	--	5	C5	<control>	<lsb> <msb>
Read Light On / Off	ME / Keyer	3	46 / 47	--	
Write Lights On / Off	ME / Keyer	3	C6 / C7	<lamp>	
Read Wipe Pattern	ME	2	48	--	
Write Wipe Pattern	ME	3	C8	<wipe>	Valid wipes are 0-9, as per the wipe pattern buttons. An invalid wipe number returns a protocol error.
Read Transition Mode	ME	2	4A	--	
Write Transition Mode	ME	3	CA	<mode>	Last 5 bits used; bit 0:key 2, bit 1:key 1, bit 2:BKGD, bit 3:key 3, bit 4:key 4.
Read ME Auto Transition Rate	ME	2	4C	--	
Read Keyer Mix Rate	Keyer	2	4D		

Name	ME / Keyer	Length	Byte Code	Data / Notes	
Read Fade to Black Rate	ME*	2	7D	--	*Currently ME Specific.
Write ME Auto Transition Rate	ME	5	CC	**	
Write Keyer Mix Rate	Keyer	5	CD	**	
Write Fade to Black Rate	--*	5	FD	**	*Currently not Supported. Fade to Black = Transition Rate
Learn Into Memory	ME	3	DA	<mem#>	Supports memories 0-255. All buses are selected with 00 for the effects address.
Recall From Memory	ME	3	DB	<mem#>	Supports memories 0-255. All buses are selected with 00 for the effects address.
Read Software Version	--	2	6C	--	
Read Field Mode	--	2	6D	--	Field Mark Only.
Write Field Mode	--	3	ED	0 or 1	Field Mark Only.
All Stop	--	3	F2	D0*	*Data byte is unused.
Read Lamp Status	--	3	78	0	
Write Lamp Status	--	13	F8	--	Included for GVG100 spec completeness only.
Write Button Press	Any	3	FB	<button>	

**Table 6: \*\*Transition Rates**

Data Byte	Bit	Notes
1	7	0=select elements, 1=select elements and perform transition
	4-6	4=select key 1, 5=select key 2, 6=select BKGD
	0-3	binary coded decimal (meaning valid values are b0-b1001, or 0-9)
2	6-7	unused
	4-5	4=select key 3, 5=select key 4
	0-3	binary coded decimal (meaning valid values are b0-b1001, or 0-9)
3	4-7	unused
	0-3	binary coded decimal (meaning valid values are b0-b1001, or 0-9)

**Table 7: Supported Lamps**

Name	ME / Keyer	Bytes	Notes
Program Bus 0-9	ME	0x00-0x09	Trying to turn off results in a protocol error.
Program Bus On-Air	ME	0x0A	Trying to turn off results in a protocol error.
Auto Trans	ME	0x0B	

Name	ME / Keyer	Bytes	Notes
Key Auto	Keyer/ME	0x0C	
Key Cut	Keyer/ME	0x0D	
Wipe (transition)	ME	0x0E	
Dissolve (transition)	ME	0x0F	
Preset Bus 0-9	ME	0x10-0x19	Trying to turn off results in a protocol error.
Preset Bus On-Air	ME	0x1A	Trying to turn off results in a protocol error.
Aspect On	ME	0x1B	Always on; trying to turn off results in a protocol error.
Positioner On	ME	0x1C	Always on; trying to turn off results in a protocol error.
Reverse Wipe	ME	0x1D	
DSK Preview	Keyer	0x1E	Always true; we don't have DSKs - all our keyers show on preview. Trying to turn off results in a protocol error.
Fade to Black	--	0x1F	
Key Bus 0-9	Keyer/ME	0x20-0x29	Trying to turn off results in a protocol error.
Key Bus On-Air	Keyer	0x2A	Trying to turn off results in a protocol error.
Key Video Fill	Keyer	0x2F	Always true; trying to turn off results in a protocol error.
Wipe Type	ME	0x30-0x39	Trying to turn off results in a protocol error.
Key Invert	Keyer/ME	0x40	DSKs; Trying to turn off results in a protocol error.
Key Mask	Keyer	0x41	DSKs; Trying to turn off results in a protocol error.
Key AutoKey	Keyer	0x42	DSKs; Trying to turn off results in a protocol error.
Key SelfKey	Keyer	0x43	DSKs; Trying to turn off results in a protocol error.
Key Invert	Keyer	0x44	Trying to turn off results in a protocol error.
Key Mask	Keyer	0x45	Trying to turn off results in a protocol error.
Memory Mode Toggle	--	0x47	Toggles between memory mode and pattern mode (are we changing patterns, or saving / loading memories?).
Next Trans is Background	--	0x48	Trying to turn off results in a protocol error.
Next Trans is Key 1	--	0x49	Trying to turn off results in a protocol error.
Cut	ME	0x4A	Trying to turn off results in a protocol error.
Key Self Key	Keyer/ME	0x4C	Trying to turn off results in a protocol error.
Key Auto Key	Keyer/ME	0x4D	Trying to turn off results in a protocol error.

Name	ME / Keyer	Bytes	Notes
Key Chroma Key	Keyer/ME	0x4E	Trying to turn off results in a protocol error.
Editor Enable	--	0x4F	Editor control is always enabled; Trying to turn off results in a protocol error.
Key Active	Keyer/ME	0x52	

**Table 8: Supported Buttons**

Name	ME / Keyer	Bytes	Notes
Program Bus 0-9	ME	0x00-0x09	Trying to turn off results in a protocol error.
Auto Trans	ME	0x0B	
Key Auto	Keyer	0x0C	DSKs
Key Cut	Keyer	0x0D	DSKs
Wipe (transition)	ME	0x0E	
Dissolve (transition)	ME	0x0F	
Preset Bus 0-9	ME	0x10-0x19	
Aspect On	ME	0x1B	Always on; button press has no effect.
Positioner On	ME	0x1C	Always on; button press has no effect.
Reverse Wipe	ME	0x1D	Doubles as " memory store / recall toggle " when in memory mode.
DSK Preview	Keyer	0x1E	Always true; we don't have DSKs - all our keyers show on preview.
Fade to Black	--	0x1F	
Key Bus 0-9	Keyer	0x20-0x29	
Key Video Fill	Keyer	0x2F	Always true.
Wipe Type	ME	0x30-0x39	
Key Invert	Keyer	0x40	DSKs
Key Mask	Keyer	0x41	DSKs
Key AutoKey	Keyer	0x42	DSKs
Key SelfKey	Keyer	0x43	DSKs
Key Invert	Keyer	0x44	
Key Mask	Keyer	0x45	
Memory Mode Toggle	--	0x47	Toggles between memory mode and pattern mode (are we changing patterns, or saving / loading memories?).
Next Trans is Background	--	0x48	
Next Trans is Key 1	--	0x49	
Cut	ME	0x4A	

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Name	ME / Keyer	Bytes	Notes
Key Self Key	Keyer	0x4C	
Key Auto Key	Keyer	0x4D	
Key Chroma Key	Keyer	0x4E	
Editor Enable	--	0x4F	Editor control is always enabled.

***ROSS***